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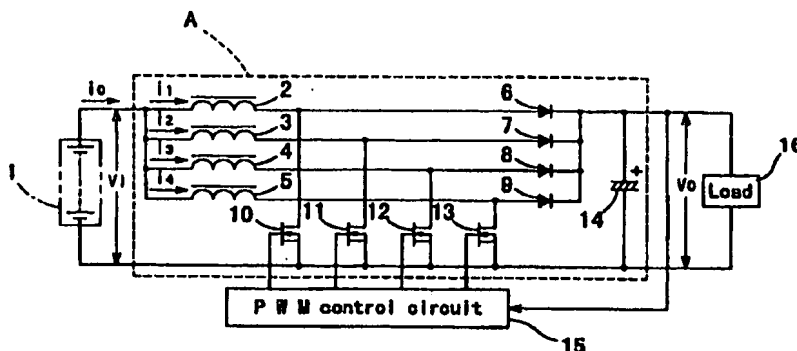
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(54) Switching regulator

(57) A switching regulator includes: a boost chopper circuit A including a plurality of inductances (2, 3, 4 and 5) which are connected in parallel with a D.C. power supply (1) for boosting the D.C. power supply (1), a plurality of commutating diodes (6, 7, 8 and 9) which are connected to output sides of those inductances (2, 3, 4 and 5), respectively, a plurality of switching elements (10, 11, 12 and 13) for connecting the D.C. power supply (1) and nodes between the respective inductances (2 to 5) and the respective diodes (6 to 9) in a short-

circuiting manner, and a smoothing capacitor (14) connected in series to a combined output section of those diodes (6 to 9); a control circuit (15) for controlling the on/off operation of those switching elements (10 to 13); and a load (16) connected in parallel with the smoothing capacitor (14). The plurality of switching elements (10 to 13) repeatedly operate while the operation of the plurality of switching elements (10 to 13) is sequentially delayed by a predetermined period of time.

Fig. 1





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EUROPEAN SEARCH REPORT

Application Number
EP 98 12 0647

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 4 972 292 A (PETERSEN ALAN) 20 November 1990 (1990-11-20)	1-3	H02M3/158
Y	* column 5, line 59 - column 6, line 55; figures 1,4 *	4	
X	US 5 278 489 A (BOWERS MARK C) 11 January 1994 (1994-01-11) * column 2, line 65 - column 3, line 25; figure 1 *	1,2	
Y	EP 0 503 715 A (PHILIPS NV) 16 September 1992 (1992-09-16) * figure 1 *	4	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			H02M
Place of search THE HAGUE		Date of completion of the search 4 February 2000	Examiner Gentili, L
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03/82 (P04001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 12 0647

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

DE19837639

Publication Title:

Converter overload protection circuit

Abstract:

Abstract of DE19837639

An overload protection circuit includes a first converter (UM1) and a second converter (UM2) connected to the first in a chain circuit, in which the first converter (UM1) has a first switching transistor to control the output voltage (UAO), and the second converter (UM2) includes a transformer (Tr) with associated rectifier unit (GR) for rectifying the transformer (Tr) secondary voltage. A decision unit (SE) controls the load current path (SD) of the first switching transistor (T1), in which current and voltage value detected at the output of the first converter (UM1) are determined and then supplied to the decision unit (SE). When safe forced tripping of the switching elements (G1,G2) in the rectifying unit (GR) is no longer possible, the first switching transistor (T1) is driven to make the load current path high- resistance.

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